WATER QUALITY OF TREASURE COUNTY

Ground Water

No ground-water samples were collected in Treasure County during the MDA's 2005 Yellowstone River Valley Project.

Some public water supplies are required to periodically test their water for various constituents including pesticides and nitrate. A search of public water supply entities in Treasure County showed that the town of Hysham has tested their water for pesticides. The town of Hysham gets water from both surface water and ground water sources and samples were taken from the treatment plant so it is unclear whether they were sampling the surface water source or the ground water source or both. However, the two pesticide samples collected in 2005 and 2002 did not contain any pesticides above the analytical method detection limits. Nitrate was detected in 10 of the 12 samples collected between 2000 and February 2006. Concentrations ranged from 0.08-0.31 mg/L, well below the drinking water standard of 10 mg/L.

Surface Water

During 1999 the U.S. Geological Survey (USGS) collected 13 samples from the Yellowstone River near Billings to the west of Treasure County and analyzed them for pesticides. Although this site is not in Treasure County the data may be indicative of the water quality in the Yellowstone River as it flows into Treasure County. The most commonly detected pesticides were atrazine and triallate (see table below). There were also single detections of carbofuran, metolachlor, prometon, and simazine. All these pesticides, with the exception of carbofuran and prometon, are commonly used herbicides in corn, sugar beets, and small grain crops. Carbufuran is an insecticide used in many of the crops common to the Yellowstone Valley. Prometon, which is a nonselective herbicide used in non-agricultural settings, is commonly used and detected in urban areas (Barbash and Resek, 1996). All of the pesticide concentrations were low and none of the concentrations exceeded any human health standards or aquatic life standards where such standards exist. It is important to note that many of the herbicides used for noxious weed control (2,4-D, picloram, and imazapyr, to name a few) were not analyzed for during the USGS monitoring effort, so the impacts of these control measures on the Yellowstone River remain unclear.

Between 1999 and September 2001 the USGS collected 38 samples from the Yellowstone River near Billings and analyzed them for nitrate. Nitrate was detected in 35 of the 38 samples at concentrations ranging from 0.04-0.52 mg/L with a median concentration of 0.15 mg/L. Nitrate concentrations showed a seasonal variation with higher concentrations occurring between October and March and lower concentrations occurring during the April to September time frame (Miller et al, 2004). These seasonal variations are believed to be due to a lack of algae activity which consumes nitrate during the winter and sources of nitrate are less dilute during the winter months when stream flows are low.

Summary of Pesticide* Detections in the Yellowstone River near Billings during 1999 and Nitrate Detections between 1999 and September 2001 - Collected by the U.S. Geological Survey

Pesticide Compound	Number of Samples Collected	Number of Samples with Pesticide Detected	Percent of Samples with Pesticide Detected	Minimum Concentration (μg/L)	Maximum Concentration (μg/L)	Drinking Water Standard (μg/L)	Aquatic Life Standard (μg/L)
Atrazine	13	5	38.5	E 0.003	0.008	3	1.80
Carbofuran	13	1	7.7	--	E 0.013	40	1.80
Metolachor	13	1	7.7	--	E 0.004	100	7.80
Prometon	13	1	7.7	--	M	100	--
Simazine	13	1	7.7	--	E 0.003	4	10
Triallate	13	3	23.1	E 0.002	0.004	--	0.24

Nutrient Compound	Number of Samples Collected	Number of Samples with Nitrate Detected	Percent of Samples with Nitrate Detected	Minimum Concentration (mg/L)	Maximum Concentration (mg/L)	Drinking Water Standard (mg/L)	Aquatic Life Standard (mg/L)
Nitrate + Nitrite	38	35	92.1	0.04	0.52	10	--

E = Estimated value M = Presence of chemical verified but not quantified
* This table only contains a summary of pesticides detected; many other pesticides were analyzed for and not detected

Barbash, J.E., and Resek, E.A., 1996, Pesticides in ground water – Distribution, Trends, and Governing Factors: Chelsea, Michigan, Ann Arbor Press, Pesticides in the Hydrologic System series, v. 2, 588 p.

Miller, K.A., Clark, M.L., and Wright, P.R., 2004, Water Quality Assessment of the Yellowstone River Basin, Montana and Wyoming – Water Quality of Fixed Sites, 1999-2001, U.S. Geological Survey Scientific Investigation Report 2004-5113.